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PELLAGRA.

ITS NATURE AND PREVENTION.

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In the following paper an attempt is made to answer, as simply as possible, the more important questions which the general public frequently asks in regard to pellagra.

Symptoms.

Although the fully developed disease makes a picture which, when once seen, can hardly ever be wrongly diagnosed even by one who is not a physician, the recognition of the disease is by no means simple, because the fully developed or classical types of cases form only a small proportion of the total.

The following sketch of the symptoms is presented, therefore, not with the idea that it will enable the untrained to recognize the disease, but rather to call attention to those symptoms or combinations of symptoms which should be looked upon as suspicious and as calling for the simple and effective measures of prevention to be outlined.

In a fairly well developed though not advanced case the disease shows itself by a variety of symptoms, of which weakness, nervousness, indigestion, and an eruption form the most distinctive combination.

Eruption.—The eruption is the most characteristic telltale of the disease and the main reliance in its recognition. When the eruption first shows itself it may look very much like a sunburn, the deceptive resemblance to which may, in some cases, be heightened by the subsequent peeling with or without the formation of blisters. In many cases the inflamed-looking skin first turns to a somewhat dirty brown, frequently parchmentlike, then quickly becomes rough and scaly, or cracks and peels. In many instances, however, the beginning redness is not noticed or does not occur, the first and perhaps the only thing observed being the dirty-looking scaly patch of skin very much like and frequently thought to be no more than a simple weathering or chapping.

Among the most distinctive peculiarities of the eruption is its preference for certain parts of the body surface. The backs of the hands in adults and the backs of the feet in children are its favorite sites. Other parts not infrequently attacked are the sides or front of the neck or both, the face, elbows, and knees. From these or other points, for it may attack any part of the body, it may spread to a varying degree. Another marked peculiarity of the eruption is its tendency to appear at about the same time, and to cover similar areas, both as to extent and peculiarities of outline, on both sides of the body. Thus it may be stated as the rule that if the back of one hand or of one foot, one elbow, one knee, one side of the neck, one cheek, or the lid of one eye is affected, then the corresponding part on the other side of the body is affected, and affected to almost exactly the same extent. This rule, however, is not without many exceptions. It must not be assumed, because the back of one hand or of one foot or of one side of the neck alone seems to be involved, or is involved to so slight an extent as to be almost nothing in comparison with the involvement of the other side, that the possibility of the disease being pellagra may be thrown out of court without further ado.

Suspicious symptoms.—Although the main reliance in the recognition of the disease, the eruption of pellagra not infrequently is very tardy in making its appearance. While, until it appears, it is ordinarily impossible to determine the presence or absence of the disease with certainty, a shrewd suspicion may, nevertheless, be formed from a careful consideration of the other symptoms. This applies only to a limited extent to children, in most of whom the manifestations of the disease, other than the eruption, are slight and frequently difficult or impossible to make out. It has happened more than once in the experience of the writer that the liveliest of a group of children was found with a well-developed eruption. Notwithstanding this, however, careful questioning of the mother, if she be observant, not infrequently develops the fact that the child seems to her less active than common; in some cases it is evidently listless and fretful and the mother may also recognize that it has fallen off in weight. In older individuals a complaint of loss of strength with indigestion or nervousness or both coming on or made worse in the spring or summer and improving in the fall and winter are very frequently met with. The patient will complain of being "worked out," of having "blind staggers" (dizziness, vertigo), of discomfort or pain in the pit of the stomach, frequently of headache, sometimes of wakefulness, frequently also of sluggishness of the bowels, requiring the habitual use of medicine to move them. Although, as has already been said, these symptoms alone or even with the addition of such symptoms as a burning or scalded feeling of the mouth, reddened tongue, burning of the hands or feet and loose bowels are not enough to distinguish pellagra from other conditions, they are ample to justify a suspicion of the disease, especially if such individual is known to be finicky or a nibbler about food, or has been living on a diet made up largely of biscuits, corn bread, grits, gravy, and sirup, with little or no milk or lean meat; in other words, on a diet mainly of cereals, starches, and fat, with but little, if any, of the animal flesh (protein) foods.

The suspicion of pellagra may with confidence be dismissed in one who is known to be, and to have been, a habitual milk drinker and meat eater. It is well to be warned, however, that it is very easy to be misled about what and how much the individual actually eats.

Insanity.—In a small proportion of cases, fortunately much smaller than is commonly believed, the mind is affected to a degree requiring asylum care. Many of these cases get well under treament. Recovery of the mind is not to be expected, however, where the pellagra occurs in a person whose insanity is due to some other (incurable) cause.

Importance and Distribution.

Under proper treatment and with careful nursing only a small percentage of cases die; nevertheless, the actual number of deaths is deplorably large. Indeed, in nearly all the Southern States pellagra is one of the foremost causes of death. Thus, in 1916, it ranked fourth in Mississippi, third in Alabama, and second in South Carolina. In that year, probably an average one so far as pellagra is concerned, this disease was charged with having caused 677 deaths in Alabama, 840 in Mississippi, 467 in North Carolina, 627 in South Carolina, 607 in Tennessee, and 452 in Texas, or an aggregate of some 3,700 deaths for these six States alone. As the fatality rate, counting all types of cases, was probably not in excess of 5 per cent, it can readily be seen that not only is this disease among the most important as a cause of death, but it probably ranks with the first in importance as a cause of sickness and lowered physical efficiency of the people in the area affected. In the six States named there probably occurred some 70,000 definite cases of pellagra. As it is quite safe to assume that there were in the remaining 7 of the 13 States south of the Potomac and Ohio Rivers—the section most seriously affected—at least half as many more, there probably occurred in this region in 1916 upward of 100,000 cases. The incomplete figures at hand indicate a considerable increase of the disease in 1917. It seems safe to assume that this increase averaged about 25 per cent, so that it may be estimated that in 1917, in the part of the country mentioned, fully 125,000 people were attacked.

In other parts of the country the disease is very much less common. The explanation for this has not been fully worked out. It depends in part, at least, on a difference in dietary habit. The people of the South are known to eat much less of the animal foods, such as milk and lean meat, than do the people in other sections. This, in its turn, is due in part to the fact that, by comparison, much less of the animal foods is raised in the South, and, therefore, in many localities they are hard to get or are too expensive for poor people to buy.

Relation to Living Cost.

It is the poor man who is the chief sufferer from this disease. This explains why hard times, especially when accompanied by rising food prices, are likely to be followed by an increase in the disease. This is well illustrated by the great increase that took place in 1915 following the hard times brought on by the outbreak of the war in Europe in the summer of 1914, and by the great decrease in 1916 following the improvement in conditions that developed during 1915. Unfortunately, the upward trend of living cost in the fall and winter of 1916 brought about an increase of pellagra in 1917 in many localities, an increase which was forecast months in advance by the United States Public Health Service.

Cause.

Pellagra not "catching."—The apparently rapid spread of the disease following the discovery of its presence in this country about 10 years ago caused great alarm and with certain other circumstances gave rise to the opinion that pellagra was a communicable disease. Fortunately, the investigations of the Public Health Service now permit one to answer the oft-repeated question, "Is pellagra catching?" in the negative.

Experimental tests and careful observations show that pellagra is not a communicable disease. No germ that can properly be considered its cause has ever been found. Attempts to give persons pellagra by inoculations of blood or saliva and other body discharges from severe cases of pellagra have failed completely. On the other hand, when 11 convicts were fed on an unbalanced diet composed mainly of biscuit, corn bread, grits, rice, gravy, and sirup, with only a few vegetables and no milk, meat, or fruit, at least six developed the disease. In an asylum where many of the inmates developed pellagra year after year it was observed that the doctors, nurses, and helpers who lived with them never developed the disease. The only discoverable reason for the exemption of the nurses and helpers was a better diet. The nurses and helpers had a liberal allowance of lean meat and some milk, while the inmates had very little or none. When this observation was tested by giving the inmates a better diet—that is, by giving them more meat, milk, fruit, and vegetables—it was found that the inmates stopped having pellagra. This test was also carried out at three orphanages where there had been many cases in the children every spring for several years, and always with the same result. After the diet was improved, although no other change was made, pellagra disappeared. Attempts to prevent pellagra by supposedly other means have succeeded only when, whether intentionally so or not, some change in diet took place at the same time.

Caused by unbalanced diet.—These facts, together with others not mentioned here, show that pellagra is caused by eating a faulty or unbalanced diet, and that people who consume a mixed, well-balanced, and varied diet, such, for example, as that furnished to our soldiers and sailors, do not have the disease. In other words, if all persons provided themselves and ate a well-selected and properly varied diet there would be no pellagra. It is very important to realize that having good food on the family table is of itself not enough to keep one from having pellagra. There may be plenty of milk or eggs or meat, but if you don't eat them, or if you just pick at them and prefer to live, as the convicts in the experiment lived, mainly on cereals, starchy foods, and sweets, the milk and eggs will do you no good, and if you persist long enough pellagra may result.

Balanced Ration Prevents Pellagra.

A properly selected or well-balanced diet is one that includes in sufficient quantities and in proper form all the elements needed by the body for its healthy growth and normal activities. In order that a proper balance may be assured, the diet should include, besides the cereals, starches, sweets, and fats, a sufficient quantity of milk or some lean meat and an abundance of green vegetables and fruit and preferably some of all of these classes of foods. How such a diet operates to prevent pellagra or, indeed, just how an unbalanced or faulty diet acts so that the symptoms of pellagra are developed is still obscure and the subject of study by many scientists. The vitally important practical thing, however, is that the right kind of a diet will keep people from having the disease and will cure those who have it if the cases are not too far advanced.

Milk is the most important single food in balancing a diet and preventing or curing pellagra, and when lean meat, green vegetables, and fruits are for any reason not included in the diet or only infrequently or in very small quantities, it is most important that at least three glassfuls (1½ pints), and preferably more, of milk (sweet or buttermilk) be taken daily. This single addition to the customary daily diet will in practically all instances protect the individual from an attack of pellagra. Milk for the family in these quantities is, however, frequently hard to procure. For this and other reasons it is wiser under such circumstances to use certain other classes of foods as substitutes or, preferably, as additions to the available milk supply.

Lean meat (fowl, fish, pork, beef, etc.) helps in an important degree to give proper balance to a diet, especially the diet of those who take but little milk. Under these circumstances an allowance of half a pound at least three or four times a week should be made. Part of the meat may be replaced by eggs or cheese. It will be wiser, however, not to make any reduction in the meat allowance recommended, but rather to add eggs and cheese to the diet.

It is often declared that Americans eat too much meat. No doubt there are many who do. It is important to recognize, however, that there are even more who do not eat enough.

In seasons when lean meats are difficult to procure or are excessively expensive, the use of the dried soya bean as a substitute for flesh food is to be highly recommended. It is but little known and relatively little used as human food in this country, though an extensively used staple in the Orient. From a nutritive standpoint, it is probably the most valuable of the dried beans and peas. Recent studies have shown it to be decidedly superior to the dried navy bean, lima bean, and the pea. The soya bean may be eaten boiled or baked and, in the form of soy-bean meal, may be included to great advantage in the biscuit or the corn bread to the extent of one-fifth to one-fourth of the flour or the corn meal.

Generous helpings of green vegetables (cabbage, collards, turnip greens, spinach, string beans, or snap beans), or fruits (apples, peaches, prunes, apricots), and preferably of both, should be included in the daily diet, especially when milk is not used or used only in small amounts. This is particularly important during the late winter and spring, the season when people have the fewest number and the least variety of things to eat.

As an illustration of the practical application of the above recommendations for a health-preserving, pellagra-preventing diet, the following outline of a bill of fare is presented:

Pellagra-Preventing Bill of Fare.

BREAKFAST.

Sweet milk, daily.
Boiled oatmeal with butter or with milk every other day.
Boiled hominy grits or mush with a meat gravy or with milk every other day.
Light bread or biscuit (one-fourth soy-bean meal), with butter, daily.

DINNER.

A meat dish (beefstew, hash, or pot roast, ham or shoulder of pork, boiled or roast fowl, broiled or fried fish, or creamed salmon or codfish cakes, etc.), at least every other day.

Macaroni with cheese, once a week.

Dried beans (boiled cowpeas with or without a little meat, baked or boiled soya beans with or without a little meat), two or three times a week.

Potatoes (Irish or sweet), four or five times a week.

Rice, two or three times a week, on days with the meat stew or the beans.

Green vegetables (cabbage, collards, turnip greens, spinach, snap beans or okra), three or four times a week.

Corn bread (one-fifth soy-bean meal), daily.

Buttermilk, daily.

SUPPER.

Light bread or biscuit (one-fourth soy-bean meal), daily.

Butter, daily.

Milk (sweet or buttermilk), daily.

Stewed fruit (apples, peaches, prunes, apricots), three or four times a week, on days when there is no green vegetable for dinner.

Peanut butter, once or twice a week.

Sirup, once or twice a week.

It will be recognized that this bill of fare is primarily for older children and adults. The intelligent housewife will, of course, make such modifications as the age of her children, the tastes of her family, and her particular circumstances suggest or make necessary. Various additions may be made to give greater variety and attractiveness to the meals. The quantities of some of the foods may be reduced and replaced, in part or in whole, by other similar foods, but so far as possible no reduction should be made in the quantities of milk and lean meats. In the case of young children eggs make a very desirable addition and the relative quantity of milk allowed them may advantageously be increased.

Treatment.

While the above recommendations have in view primarily pellagra prevention, the same diet serves satisfactorily also in the treatment and cure of the average case. For severe cases a more liberal allowance of milk should be made and eggs added. In some instances, in fact, only liquids can be taken. In these, milk, fresh-meat juice, meat broth, bean, pea, or potato puree, and pot liquor should form the diet until more substantial food (milk toast, soft boiled or coddled eggs) can be added. The food should be given at regular intervals just as is done with medicine. Indeed, for the cure of pellagra the only medicine we have is the diet. The only use that medicines serve in pellagra is the alleviation of painful symptoms and in the treatment of complicating conditions. The sooner this is realized the sooner will the quacks, both within and without the profession, be put out of business. The money that is now being wasted on useless and quack medicines is well-nigh sufficient to procure for the poor, deluded sufferers the food from the lack of which they are suffering.

A change of climate is of itself not an essential in the treatment and cure of pellagra. A change from city, village, or "camp" to a farm in the country has not infrequently been found to be beneficial. The benefit derived is to be attributed, however, not to the change of air, as is commonly thought, but rather to the fact that in the country the diet is improved by an abundance of milk, eggs, etc. Practically all the benefits of a "change of climate" may be had at home at the cost of two quarts of milk and half a dozen eggs or half a pound of stew beef a day.

The patient should be warned that a proper diet is not to be considered as a temporary thing which can be dispensed with after recovery from the attack. To avoid a recurrence of the disease and permanently to maintain health and vigor a properly selected diet is essential and must be maintained at all times. It is worth while emphasizing that if all people provided themselves and, at all times, ate a well-balanced diet, pellagra would disappear from the face of the earth. The gain to the country from the consequent reduction of sickness, invalidism, and death, and the increased physical vigor and happiness of the people can not be overestimated.

EFFECT OF THE AIR HAMMER ON THE HANDS OF STONECUTTERS.

In the Public Health Reports of March 22, 1918, appeared reports of investigations made by officers of this service in regard to health hazards from the use of the air hammer in cutting Indiana limestone.

A similar investigation has recently been made by Dr. Alice Hamilton for the Bureau of Labor Statistics of the United States Department of Labor. Her report will appear in the April, 1918, issue of the monthly review of that bureau. Through the courtesy of Dr. Royal Meeker, Commissioner of Labor Statistics, there is given below the summary of the report made by Dr. Alice Hamilton:

Summary.

Among users of the air hammer for cutting stone there appears very commonly a disturbance in the circulation of the hands, which consists in spasmodic contraction of the blood vessels of certain fingers, making them blanched, shrunken, and numb.